

## CLAIMS

1. A peptide comprising an amino acid sequence derived from a protein of human papilloma virus (HPV), wherein said amino acid sequence has the ability to bind to a human Major Histocompatibility Complex (MHC) Class I molecule.
- 5 2. A peptide according to claim 1, wherein said amino acid sequence is derived from protein E6 or E7 of HPV16.
3. A peptide according to claim 1, wherein said amino acid sequence is derived from protein E6 or E7 of HPV18.
4. A peptide according to claim 1 or claim 2 or claim 3,  
10 wherein said amino acid sequence has the ability to bind to human MHC Class I allele HLA-A2.1.
5. A peptide according to claim 1, comprising an amino acid sequence derived from protein E6 or E7 of HPV16, wherein said amino acid sequence has the ability to bind to human MHC Class I  
15 allele HLA-A2.1 and is selected from the group consisting of:
 

	AMFQDPQER	(residues 7- 15 of HPV16 protein E6)
	KLPQLCTEL	(residues 18- 26 of HPV16 protein E6)
	QLCTELQTT	(residues 21- 29 of HPV16 protein E6)
	LCTELQTTI	(residues 22- 30 of HPV16 protein E6)
20	ELQTTIHDI	(residues 25- 33 of HPV16 protein E6)
	LQTTIHDI	(residues 26- 34 of HPV16 protein E6)
	TIHDIILEC	(residues 29- 37 of HPV16 protein E6)
	IHDIILECV	(residues 30- 38 of HPV16 protein E6)
	CVYCKQQLL	(residues 37- 45 of HPV16 protein E6)
25	FAFRDLCIV	(residues 52- 60 of HPV16 protein E6)
	KISEYRHYC	(residues 79- 87 of HPV16 protein E6)
	PLCDLLIRC	(residues 102-110 of HPV16 protein E6)
	TLHEYMLDL	(residues 7- 15 of HPV16 protein E7)
	YMLDLQPET	(residues 11- 19 of HPV16 protein E7)
30	MLDLQPETT	(residues 12- 20 of HPV16 protein E7)
	RLCVQSTHV	(residues 66- 74 of HPV16 protein E7)
	TLEDLLMGT	(residues 78- 86 of HPV16 protein E7)
	LLMGTLGIV	(residues 82- 90 of HPV16 protein E7)

GTLGIVCPI (residues 85- 93 of HPV16 protein E7)  
TLGIVCPIC (residues 86- 94 of HPV16 protein E7), and  
a fragment, homolog, isoform, derivative, genetic variant

or conservative variant of any one of these amino acid sequences  
5 which has the ability to bind to human MHC Class I allele HLA-  
A2.1.

6. A peptide according to claim 1, comprising an amino acid  
sequence derived from protein E6 or E7 of HPV18, wherein said  
amino acid sequence has the ability to bind to human MHC Class I  
10 allele HLA-A2.1 and is selected from the group consisting of:

KLPDLCTEL (residues 13- 21 of HPV18 protein E6)  
SLQDIEITC (residues 24- 32 of HPV18 protein E6)  
LQDIEITCV (residues 25- 33 of HPV18 protein E6)  
EITCVYCKT (residues 29- 37 of HPV18 protein E6)  
15 KTVLELTEV (residues 36- 44 of HPV18 protein E6)  
ELTEVFEFA (residues 40- 48 of HPV18 protein E6)  
FAFKDLFVV (residues 47- 55 of HPV18 protein E6)  
DTLEKLTNT (residues 88- 96 of HPV18 protein E6)  
LTNTGLYNL (residues 93-101 of HPV18 protein E6)  
20 TLQDIVLHL (residues 7- 15 of HPV18 protein E7)  
FQQLFLNTL (residues 86- 94 of HPV18 protein E7)  
QLFLNTLSF (residues 88- 96 of HPV18 protein E7)  
LFLNTLSFV (residues 89- 97 of HPV18 protein E7)  
LSFVCPWCA (residues 94-102 of HPV18 protein E7), and

25 a fragment, homolog, isoform, derivative, genetic  
variant or conservative variant of any one of these amino acid  
sequences which has the ability to bind to human MHC Class I  
allele HLA-A2.1.

7. A peptide according to claim 1, wherein said amino acid  
30 sequence has the ability to bind to human MHC Class I allele HLA-  
A1.

8. A peptide according to claim 1, comprising an amino acid  
sequence derived from protein E6 or E7 of HPV16, wherein said  
amino acid sequence has the ability to bind to human MHC Class I  
35 allele HLA-A1 and is selected from the group consisting of:

YRDGNPYAV (residues 61- 69 of HPV16 protein E6)

WTGRCMSCC (residues 139-147 of HPV16 protein E6)  
MSCCRSSRT (residues 144-152 of HPV16 protein E6)  
TTDLICYEQ (residues 19- 27 of HPV16 protein E7)  
EIDGPAGQA (residues 37- 45 of HPV16 protein E7)  
HVDIRTLED (residues 73- 81 of HPV16 protein E7), and  
a fragment, homolog, isoform, derivative, genetic

variant or conservative variant of any one of these amino acid  
sequences which has the ability to bind to human MHC Class I  
allele HLA-A1.

9. A peptide according to claim 1, wherein said amino acid  
sequence has the ability to bind to human MHC Class I allele HLA-  
A3.2.

10. A peptide according to claim 1, comprising an amino acid  
sequence derived from protein E6 or E7 of HPV16, wherein said  
amino acid sequence has the ability to bind to human MHC Class I  
allele HLA-A3.2 and is selected from the group consisting of:

AMFQDPQER (residues 7- 15 of HPV16 protein E6)  
IILECVYCK (residues 33- 41 of HPV16 protein E6)  
CVYCKQQLL (residues 37- 45 of HPV16 protein E6)  
VYCKQQLLR (residues 38- 46 of HPV16 protein E6)  
QQLLRREVY (residues 42- 50 of HPV16 protein E6)  
IVYRDGNPY (residues 59- 67 of HPV16 protein E6)  
YAVCDKCLK (residues 67- 75 of HPV16 protein E6)  
AVCDKCLKF (residues 68- 76 of HPV16 protein E6)  
VCDKCLKFY (residues 69- 77 of HPV16 protein E6)  
KFYSKISEY (residues 75- 83 of HPV16 protein E6)  
KISEYRHYC (residues 79- 87 of HPV16 protein E6)  
ISEYRHYCY (residues 80- 88 of HPV16 protein E6)  
RHYCYSLYG (residues 84- 92 of HPV16 protein E6)  
SLYGTTLEQ (residues 89- 97 of HPV16 protein E6)  
TTLEQQYNK (residues 93-101 of HPV16 protein E6)  
QQYNKPLCD (residues 97-105 of HPV16 protein E6)  
LIRCINCQK (residues 107-115 of HPV16 protein E6)  
HLDKKQRFH (residues 125-133 of HPV16 protein E6)  
CMSCCRSSR (residues 143-151 of HPV16 protein E6)  
SCCRSSRTR (residues 145-153 of HPV16 protein E6)

CCRSSRTRR (residues 146-154 of HPV16 protein E6)  
HYNIVTFCC (residues 51- 59 of HPV16 protein E7)  
YNIVTFCK (residues 52- 60 of HPV16 protein E7)  
CCKCDSTLR (residues 58- 66 of HPV16 protein E7)  
KCDSTLRLC (residues 60- 68 of HPV16 protein E7), and

a fragment, homolog, isoform, derivative, genetic variant or conservative variant of any one of these amino acid sequences which has the ability to bind to human MHC Class I allele HLA-A3.2.

11. A peptide according to claim 1, wherein said amino acid sequence has the ability to bind to human MHC Class I allele HLA-A11.2.

12. A peptide according to claim 1, comprising an amino acid sequence derived from protein E6 or E7 of HPV16, wherein said amino acid sequence has the ability to bind to human MHC Class I allele HLA-A11.2 and is selected from the group consisting of:

AMFQDPQER (residues 7- 15 of HPV16 protein E6)  
IILECVYCK (residues 33- 41 of HPV16 protein E6)  
CVYCKQQLL (residues 37- 45 of HPV16 protein E6)  
VYCKQQLLR (residues 38- 46 of HPV16 protein E6)  
QQLLRREVY (residues 42- 50 of HPV16 protein E6)  
IVYRDGNPY (residues 59- 67 of HPV16 protein E6)  
YAVCDKCLK (residues 67- 75 of HPV16 protein E6)  
AVCDKCLKF (residues 68- 76 of HPV16 protein E6)  
VCDKCLKFY (residues 69- 77 of HPV16 protein E6)  
KISEYRHYC (residues 79- 87 of HPV16 protein E6)  
ISEYRHYCY (residues 80- 88 of HPV16 protein E6)  
LIRCINCQK (residues 107-115 of HPV16 protein E6)  
TGRCMSCCR (residues 140-148 of HPV16 protein E6)  
CMSCCRSSR (residues 143-151 of HPV16 protein E6)  
SCCRSSRTR (residues 145-153 of HPV16 protein E6)  
HYNIVTFCC (residues 51- 59 of HPV16 protein E7)  
YNIVTFCK (residues 52- 60 of HPV16 protein E7)  
CCKCDSTLR (residues 58- 66 of HPV16 protein E7)  
VCPICSQKP (residues 90- 98 of HPV16 protein E7), and  
a fragment, homolog, isoform, derivative, genetic

variant or conservative variant of any one of these amino acid sequences which has the ability to bind to human MHC Class I allele HLA-A11.2.

13. A peptide according to claim 1, wherein said amino acid

5 sequence has the ability to bind to human MHC Class I allele HLA-A24.

14. A peptide according to claim 1, comprising an amino acid sequence derived from protein E6 or E7 of HPV16, wherein said amino acid sequence has the ability to bind to human MHC Class I

10 allele HLA-A24 and is selected from the group consisting of:

MHQKRTAMF (residues 1- 9 of HPV16 protein E6)

LQTTIHDII (residues 26- 34 of HPV16 protein E6)

VYCKQQLLR (residues 38- 46 of HPV16 protein E6)

LLRREVDYDF (residues 44- 52 of HPV16 protein E6)

15 VYDFAFRDL (residues 49- 57 of HPV16 protein E6)

PYAVCDKCL (residues 66- 74 of HPV16 protein E6)

KCLKFYSKI (residues 72- 80 of HPV16 protein E6)

EYRHYCYSL (residues 82- 90 of HPV16 protein E6)

HYCYSLYGT (residues 85- 93 of HPV16 protein E6)

20 CYSLYGTTL (residues 87- 95 of HPV16 protein E6)

RFHNIRGRW (residues 131-139 of HPV16 protein E6)

RAHYNIVTF (residues 49- 57 of HPV16 protein E7), and

a fragment, homolog, isoform, derivative, genetic

variant or conservative variant of any one of these amino acid  
25 sequences which has the ability to bind to human MHC Class I allele HLA-A24.

15. A peptide according to any one of the claims 1-14, having a length of from 9 to 12 amino acids.

16. A pharmaceutical composition containing a

30 prophylactically or therapeutically effective amount of a peptide according to any one of the claims 1-15, and a pharmaceutically acceptable carrier, diluent, excipient or adjuvant.

17. A pharmaceutical composition containing a

prophylactically or therapeutically effective amount of a peptide

35 according to any one of the claims 1-15 which is able to induce a

T cell response effective against HPV, and a pharmaceutically acceptable carrier, diluent, excipient or adjuvant.

18. A pharmaceutical composition containing a

5 prophylactically or therapeutically effective amount of a peptide according to any one of the claims 1-15 which is able to induce a HLA class I-restricted CD8<sup>+</sup> cytotoxic T cell response effective against HPV, and a pharmaceutically acceptable carrier, diluent, excipient or adjuvant.

10 19. A method of prophylactic or therapeutic treatment of cervical carcinoma and other HPV-related diseases with a human individual, comprising administering to said human individual a prophylactically or therapeutically effective amount of a peptide according to any one of the claims 1-15.

15 20. A method of prophylactic or therapeutic treatment of cervical carcinoma and other HPV-related diseases with a human individual, comprising administering to said human individual a prophylactically or therapeutically effective amount of an immunogenic form of a peptide according to any one of the claims 1-15 which is able to induce a T cell response effective against  
20 HPV.

21. A method of prophylactic or therapeutic treatment of cervical carcinoma and other HPV-related diseases with a human individual, comprising administering to said human individual a prophylactically or therapeutically effective amount of an  
25 immunogenic form of a peptide according to any one of the claims 1-15 which is able to induce a HLA class I-restricted CD8<sup>+</sup> cytotoxic T cell response effective against HPV.

22. A peptide according to any one of claims 1-15 for prophylactically or therapeutically inducing in a human individual  
30 a HLA class I-restricted CD8<sup>+</sup> cytotoxic T cell response effective against HPV.

23. Use of a peptide according to any one of claims 1-15 for preparing a pharmaceutical composition for prophylactically or therapeutically inducing in a human individual a HLA class I-  
35 restricted CD8<sup>+</sup> cytotoxic T cell response effective against HPV.